DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION
Interim Final 2/5/99
RCRA Corrective Action
Environmental Indicator (EI) RCRIS code (CA750)

Migration of Contaminated Groundwater Under Control

Facility Name: **Turbine Airfoil Designs, Inc.**
Facility Address: **1400 North Cameron Street Harrisburg, Pennsylvania 17110**
Facility EPA ID #: **PAD003010113**

1. Has all available relevant/significant information on known and reasonably suspected releases to the groundwater media, subject to RCRA Corrective Action (e.g., from Solid Waste Management Units [SWMU], Regulated Units [RU], and Areas of Concern [AOC])

   [X] If yes – check here and continue with #2 below.

   [ ] If no – re-evaluate existing data, or

   [ ] If data are not available skip to #6 and enter "IN" (more information needed) status code.

BACKGROUND

Definition of Environmental Indicators (for the RCRA Corrective Action)

Environmental Indicators (EI) are measures being used by the RCRA Corrective Action program to go beyond programmatic activity measures (e.g., reports received and approved, etc.) to track changes in the quality of the environment. The two EI developed to-date indicate the quality of the environment in relation to current human exposures to contamination and the migration of contaminated groundwater. An EI for non-human (ecological) receptors is intended to be developed in the future.

Definition of "Migration of Contaminated Groundwater Under Control" EI

A positive "Migration of Contaminated Groundwater Under Control" EI determination ("YE" status code) indicates that the migration of "contaminated" groundwater has stabilized, and that monitoring will be conducted to confirm that contaminated groundwater remains within the original "area of contaminated groundwater" (for all groundwater "contamination" subject to RCRA corrective action at or from the identified facility (i.e., site-wide)).

Relationship of EI to Final Remedies

While Final remedies remain the long-term objective of the RCRA Corrective Action program the EI are near-term objectives which are currently being used as Program measures for the Government Performance and Results Act of 1993, GPRA). The "Migration of Contaminated Groundwater Under Control" EI pertains ONLY to the physical migration (i.e., further spread) of contaminated ground water and contaminants within groundwater (e.g., non-aqueous phase liquids or NAPLs). Achieving this EI does not substitute for achieving other stabilization or final remedy requirements and expectations associated with sources of contamination and the need to restore, wherever practicable, contaminated groundwater to be suitable for its designated current and future uses.

Duration / Applicability of EI Determinations

EI Determinations status codes should remain in RCRIS national database ONLY as long as they remain true (i.e., RCRIS status codes must be changed when the regulatory authorities become aware of contrary information).

2. Is **groundwater** known or reasonably suspected to be **"contaminated"**[1] above appropriately protective "levels" (i.e., applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria) from releases subject to RCRA Corrective Action, anywhere at, or from, the facility?

X If yes - continue after identifying key contaminants, citing appropriate "levels," and referencing supporting documentation.

____ If no - skip to #8 and enter "YE" status code, after citing appropriate "levels," and referencing supporting documentation to demonstrate that groundwater is not "contaminated."

____ If unknown - skip to #8 and enter "IN" status code.

Rationale and Reference(s):

The subject and surrounding properties were owned by Harrisburg Steel Corporation (HSC) between 1916 and 1943. HSC reportedly used the property as a slag disposal site in the 1920s and 1930s (AT Kearney [ATK], 1989). The facility was constructed in 1942 and manufacture of high pressure gas cylinders and demolition bombs, and shells without live charges began in 1943. The property on which the facility was located was ultimately sold to the Commonwealth of Pennsylvania in 1949, and has been used for the manufacture of jet airplane parts since that time. The facility has been operated by various leased entities, specifically TRW, Inc. [TRW], Chromalloy American Corporation (Chromalloy), and Turbine Airfoil Designs, Inc. (TAD). Note that TRW operated on both the subject property (18.62 acres) and the property currently owned by Dayton Parts, Inc. (Dayton) (formerly Stanley Spring Works, located west of Paxton Creek and at the southwest corner of the intersection of Cameron and Calder Streets. However, TRW operated as two separate entities using separate USEPA ID numbers. TRW Turbine Airfoils Division (USEPA ID PA003010113, subject facility) operated on the subject property, while TRW Heavy Duty Parts Division (USEPA ID PAD101657179, now owned by Dayton Parts Harrisburg Truck Springs Manufacturing) operated on the property currently owned by Dayton.

TRW, the original applicant of the Part A Hazardous Waste Permit submitted in 1980, conducted the following operations at the facility: (1) finish machining of both rotor and stator turbine blades to final size for sale as original equipment; (2) bonding a metallic or ceramic coating on some turbine blades to enhance oxidation and/or sulfidation resistance; and (3) providing a repair service for used rotor and stator blades for turbine users and operators.

During 1988, TRW manufactured blades and vanes for the aircraft industry according to the manufacturing process described in the Resource Conservation and Recovery Act (RCRA) Facility Assessment (RFA) (ATK, 1989). The parts were manufactured from an alloy of nickel and cobalt. The machining process consisted of either the conventional methods (forging or casting, depending on the type of blade) or the electro-discharge machining (EDM) method. The conventional method required descaling using potassium hydroxide and degreasing using 1,1,1-trichloroethane (TCA), followed by sandblasting. Certain areas of the parts (such as the airfoil and gas path areas) were coated with aluminum silicon powder and heat-treated in a furnace to provide strength. The part was then etched with a solution of phosphoric, hydrochloric, or nitric acid to remove surficial impurities. Following the etching process, the part was provided with a hardened wearing surface by a plasma spray process before final inspection. The EDM method employed an electrode in a dielectric fluid (EDM oil) for a greater precision in shape than the conventional process, wherein the part took the shape of the electrode. After the part was shaped, the method of manufacturing for the final process was the same as the conventional process. The EDM oil was never disposed, but continuously recycled from a 5,000 gallon tank. The sludge accumulated on the filters (from recirculation of the oil from the tank) was collected in drums. Analytical data indicated that it was not ignitable, reactive or extraction procedure (EP) toxic (ATK, 1989). The EDM sludge reportedly was transported off-site for disposal.

In 2006, the Commonwealth of Pennsylvania sold the 18.62 acres on which the subject facility is located. The property

[1] "Contamination" and "contaminated" describes media containing contaminants (in any form, NAPL and/or dissolved, vapors, or solids, that are subject to RCRA) in concentrations in excess of appropriate "levels" (appropriate for the protection of the groundwater resource and its beneficial uses).

was sold to NL Ventures via TAD who ultimately leased the property. TAD commenced manufacturing operations in 2002. The current property owner is NL Ventures. The facility was leased by TAD until January 10, 2010, when the facility was vacated. The facility is currently vacant and the majority of the equipment sold. Some wastes generated by TAD remain on-site and are currently being managed by NL Ventures under the Consent Order and Agreement (COA), dated July 11, 2008, to which TAD is also a party.

Solid Waste Management Units: In 1989, on behalf of USEPA, ATK conducted a RFA of the TRW facility to identify and evaluate past and potential releases to the environment from SWMUs and other AOCs present at the facility. ATK identified seven SWMUs and three AOCs during its evaluation of the TRW facility.

In 2007, Alliance Environmental Services, Inc. (AES) conducted an environmental investigation to determine baseline soil, groundwater, and soil vapor conditions at nine AOCs identified at the facility (see *Investigations*). During AES' investigation, there was no evidence of active underground storage tanks (USTs) at the facility, and none were known to have been present since removal of 11 USTs from four general locations on the property in 1986/1987.

On February 3, 2010, an inspection was conducted by the Pennsylvania Department of Environmental Protection (PADEP) at the facility to evaluate and report on the current conditions of the SWMUs and AOCs identified in 1986 by ATK and those identified during review of regulatory files for the facility. The majority of the wastes observed by PADEP have been removed/disposed. Approximately 100 drums of non-hazardous waste and empty totes were removed from the facility. No hazardous wastes have been removed from the property. These wastes have been moved into the main manufacturing building awaiting sampling and analysis. Waste materials also remain in the treatment/holding vessels for the on-site wastewater treatment system and in the facility central coolant systems.

Investigations: The RFA of the TRW Turbine Airfoils Division facility was conducted by ATK in 1989 to identify and evaluate actual and potential releases to the environment from SWMUs and other identified AOCs. Seven SWMUs and four AOCs were identified at the facility. Details of the manufacturing process and wastes generated were presented in the RFA report, along with a list of wastewater permits, air emissions permits, and fuel oil/gasoline USTs. General descriptions of the environmental setting (e.g., geology, hydrogeology, surface water, and meteorology) and pollution migration pathways were also provided. Potential exposure pathways via soil, groundwater, and the surface waters of Paxton Creek were considered to be low. Potential receptors to contaminated soil were expected to be limited to facility employees; no groundwater wells were identified within a one mile radius of the facility; and Paxton Creek was not known to be used for recreational or drinking water purposes downstream of the facility. The report indicated there was no known potential exposure to subsurface gas resulting from activities conducted at the facility; however, exposure to airborne aluminum oxide particles and wastewater treatment sludge particles from the outdoor storage areas by facility employees and residents within one mile of the facility was identified as a potential exposure pathway.

On January 26, 2006, LandAmerica Corporation (LAC), on behalf of NL Ventures, issued a Phase I Site Assessment Report for the facility. LAC identified several areas of recognized environmental conditions related to the former locations of USTs and ASTs, waste storage areas, stained areas observed during the Phase I evaluation, and the location of a pad-mounted electrical transformer that was in poor condition. LAC recommended further investigation be conducted in these areas.

Nine soil borings drilled at the facility during LAC's Phase II investigation were converted to temporary groundwater monitoring wells (TW-1, TW-2, TW-3, TW-5, TW-6, TW-7, TW-9, TW-11, and TW-12). Groundwater samples were collected from all of the wells, except TW-9 and TW-12, which did not yield sufficient amounts of groundwater for sampling. The groundwater samples collected from TW-1 through TW-7 were analyzed for volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs). Groundwater samples from TW-3, TW-5, and TW-7 also were analyzed for total metals (Note: only SB-7 soil was analyzed for metals. In addition, the report indicates that temporary well TW-3 was sampled for metals; however, the tabulated data and the discussion of the analytical results indicate that TW-2 was sampled for metals along with TW-5 and TW-7, not TW-3.) The TW-11 groundwater sample was analyzed for SVOCs only. The groundwater analytical results were compared to the PADEP Statewide Health Standards groundwater non-residential (NR) medium specific concentrations (MSCs) for used aquifers containing less than 2,500 mg/L total dissolved solids (TDS). The results of groundwater samples collected from the temporary wells indicated that arsenic, barium, chromium, lead, and mercury were present in groundwater above the NR MSCs adjacent to fuel oil UST

7 (barium, lead, and mercury), outside the metal grinding sludge treatment area (chromium and lead), and adjacent to the existing hazardous waste storage area (arsenic, chromium, and lead). No VOCs were reportedly detected in the groundwater samples. SVOCs were not detected in any of the groundwater samples except TW-11, located within former UST 4 (fuel oil UST). Fluorene (520 µg/L) and phenanthrene (590 µg/L) were detected at concentrations below the NR MSCs. A concentration of 1-methylnaphthalene (2,700 µg/L) also was detected; however, there was no PADEP MSC for this parameter at the time of the reporting. One SVOC was detected above the NR MSC, which was 2-methylnaphthalene at a concentration of 3,700 µg/L. Based on the data collected during the Phase II investigation, LAC concluded that releases of hazardous materials (solvents) and petroleum constituents had occurred at the facility. LAC further concluded that the elevated concentrations of metals in soil and groundwater may be attributed to the reported historical dumping of slag on the property. LAC recommended the following further actions at the facility: (1) notifying PADEP of the findings of the subsurface investigation; (2) conducting further delineation of contamination in the form of additional sampling and/or site characterization to be determined by PADEP; and (3) possibly entering the property into the Voluntary Cleanup Program (Act 2).

In March 2006, AES conducted additional characterization activities for LAC to evaluate the technical and financial obligations that would be anticipated to move the facility through the Act 2 program and demonstrate attainment under the Special Industrial Area (SIA) standard. AES installed five groundwater monitoring wells to depths ranging from 20 to 30 feet bgs. The wells were installed in the following locations:

- MW-1 – East of former fuel oil USTs 8, 9, and 10
- MW-2 – South of former fuel oil UST 7
- MW-3 – Southeast of pad-mounted transformer
- MW-4 – Southeast of former fuel oil USTs 1, 2, 3, and 4
- MW-5 – Northeast of former fuel oil USTs 1, 2, 3, and 4

One round of groundwater samples was collected and the samples were analyzed for VOCs, SVOCs, and dissolved metals. VOCs detected in the groundwater samples included: n- and sec-butylbenzene, cis-1,2- dichloroethane (DCE), and trichloroethene (TCE). The detected concentrations were below the NR MSCs, except TCE, which was detected at a concentration of 5.14 µg/L in MW-3. SVOCs detected in the groundwater samples included acenaphthene, benzo(g,h,i)perylene, fluoranthene, fluorene, 1-methylnaphthalene, naphthalene, phenanthrene, and pyrene. The majority of the detected parameters were below the NR MSCs except benzo(g,h,i)perylene at MW-2 (0.42 µg/L), MW-3 (0.31 µg/L), and MW-5 (0.42 µg/L). Chromium was the only metal detected at dissolved concentrations in groundwater. Chromium was detected at MW-3 at 60 µg/L, below the NR MSC. Based on the data collected by LAC and AES, AES recommended that NL Ventures pursue the SIA standard, which involved preparation and submittal to PADEP of a work plan for a baseline remedial investigation, preparation of a Baseline Environmental Report (BER), submittal of a Notice of Intent to Remediate (NIR), and assistance with preparation of a COA. AES also recommended that NL Ventures conduct indoor air sampling, consider collecting a second round of groundwater samples, and prepare a final report to document the work performed under the COA.

On September 20, 2007, the BER was prepared by AES and submitted to PADEP. The BER described the investigation activities conducted at nine AOCs identified at the facility to determine baseline soil, groundwater, and soil vapor conditions. All work was done in accordance with the BER Work Plan approved by PADEP in December 2006.

Based on a review of historical documentation, nine AOCs were investigated, which included the following:

- AOC 1: Former USTs - Four fuel oil USTs (72,000 gallons; 74,000 gallons; 76,000 gallons; and 78,000 gallons) and one 1,000-gallon unleaded gasoline UST
- AOC 2: Former USTs - Two 20,000-gallon fuel oil USTs
- AOC 3: Former UST - One 1,000-gallon fuel oil UST
- AOC 4: Former USTs - Three 2,000-gallon fuel oil USTs
- AOC 5: Former ASTs and Current AST - One 20,000-gallon fuel oil AST; one 5,000 gallon fuel oil AST; one 10,000-gallon waste oil AST; one 5,000-gallon TCE AST; and one 5,000-gallon waste oil AST (existing)
- AOC 6: Former ASTs - Two 5,000-gallon waste oil ASTs
- AOC 7: Transformers
- AOC 8: RCRA Waste Area

- AOC 9: Landfill – Fill material (slag) covering entire property

During additional investigation activities conducted in March 2006, AES installed five shallow groundwater monitoring wells (MW-1 through MW-5) downgradient of AOCs identified at the facility. During the baseline environmental investigation conducted in January through April 2007, AES installed three additional shallow groundwater wells (MW-6, MW-7, and MW-8). MW-6 was installed to further characterize groundwater in AOC 1. MW-7 was installed within AOC 5, northeast of AOC 2, to further characterize groundwater in the vicinity of these areas. MW-8 was installed downgradient of MW-6 to determine the extent of separate phase liquids (SPL) observed in MW-6. MW-6 and MW-7 were installed in January 2007, and MW-8 was installed in May 2007.

Groundwater samples were collected from the monitoring well network in January and April 2007. The samples were submitted for the analysis of VOCs, SVOCs, polychlorinated biphenyl (PCBs), and metals. No VOCs were detected at MW-1, MW-4, MW-7, or MW-8. TCE and vinyl chloride were detected in several wells at concentrations exceeding the NR MSCs, which were 5 µg/L and 2 µg/L, respectively. TCE was detected at MW-2 (15.3 µg/L), MW-3 (5.14 µg/L), and MW-5 (5.2 µg/L). Vinyl chloride was detected at 2.1 µg/L at MW-5. SVOCs detected in the monitoring wells above the NR MSCs included 2-methylnaphthalene (5,620 µg/L), phenanthrene (1,690 µg/L), and pyrene (157 µg/L) at MW-6; and benzo(a)pyrene (0.24 µg/L) and benzo(g,h,i)perylene (0.79 µg/L) at MW-8. Groundwater from MW-6 also contained detectable concentrations of dibenzofuran and 1-methylnaphthalene that do not have MSCs, nor do they have corresponding life time health advisory levels, which could otherwise serve as the MSC. One PCB, Arochlor 1254, was detected at 0.34 µg/L at MW-6 located near the former pad-mounted transformer; however, this was the only PCB detected in any monitoring well on-site and the concentration was below the 1.4 µg/L NR MSC for this compound. Arsenic (MW-5), hexavalent chromium (MW-1 and MW-3), and zinc (MW-2) were detected during one or both sampling events above laboratory reporting limits, but below their respective NR MSCs.

In addition to the dissolved SVOCs, SPL was observed in MW-6 during the first sampling round. SPL was not observed during drilling/installation of the well. In April 2007, AES collected a sample of the SPL, which was identified by fingerprint analysis as diesel/No.2 fuel oil. AES initiated interim remedial action to recover the SPL from MW-6, removing approximately two gallons from the well using a bailer. The SPL was bailed until no appreciable thickness was observed. It was determined that the SPL was not associated with a recent release, and was likely to have occurred prior to the mid-1980s, related to a release from the concrete heating oil USTs (USTs 1, 2, 3, and 4) that were present in the area.

3. Has the **migration** of contaminated groundwater **stabilized** (such that contaminated groundwater is expected to remain within "existing area of contaminated groundwater"[2] as defined by the monitoring locations designated at the time of this determination)?

X If yes - continue, after presenting or referencing the physical evidence (e.g., groundwater sampling/measurement/migration barrier data) and rationale why contaminated groundwater is expected to remain within the (horizontal or vertical) dimensions of the "existing area of groundwater contamination"[2]).

____ If no (contaminated groundwater is observed or expected to migrate beyond the designated locations defining the "existing area of groundwater contamination"[2]) - skip to #8 and enter "NO" status code, after providing an explanation.

____ If unknown - skip to #8 and enter "IN" status code.

Rationale and Reference(s):

Groundwater: Many soil samples were collected to investigate the facility; however, only two areas were identified with constituents above the soil-to-groundwater NR MSCs, AOC 6 and AOC 8. AOC 6 - Two surface soil samples were collected at AOC 6. The samples were submitted for analysis of PADEP waste oil short list compounds. PCE, three SVOCs, and lead were detected in one or both of the samples above reporting limits, but below the NR MSCs. TCE was detected in both samples; however, TCE only exceeded the soil-to-groundwater NR MSC in one of the samples. AOC 8 - Two surface soil samples were collected at AOC 8 and submitted for analysis of VOCs, SVOCs, and metals. PCE and TCE were detected above the soil-to-groundwater NR MSCs in both samples. Cis-1,2-DCE, 18 SVOCs, and five metals were detected above laboratory reporting limits, but below their respective MSCs. Total chromium was detected above the soil-to-groundwater NR MSC in both samples; however, the detected concentration was compared to the NR MSC for hexavalent chromium (CrVI).

The analytical results for groundwater samples collected from five of the eight monitoring wells installed at the site by AES (2007) indicate the presence of several VOCs and SVOCS above the NR MSCs, particularly in the vicinity of MW-6, where SPL has been observed. Depths to groundwater measured in the monitoring wells ranged from approximately 10 feet bgs on the southern end of the property to approximately 20 feet bgs on the northern end of the property. The typical depth to groundwater reportedly was greater than 15 feet bgs (AES, 2007). SPL was not observed in the surrounding monitoring wells and the analytical results of these wells did not exhibit elevated concentrations of dissolved SVOCs. Therefore, AES concluded that the SPL was confined to the area of the former UST excavation. AES concluded that the SPL did not pose an immediate, direct, or imminent threat because the liquid was at depth and was composed substantially of the low-solubility remnants, which were not mobile. Therefore, no further remedial measures were proposed for groundwater other than the filing of a deed restriction in accordance with 35 P.S. Section 6026.305. The language in the deed restriction would require that groundwater not be used for drinking or agricultural purposes at the site.

PADEP approved the BER on December 10, 2007. Based on the findings of the BER, TAD and NL Ventures obtained liability protection afforded under Act 2 for the constituents of concern (TCE, vinyl chloride, benzo(a)pyrene, benzo(g,h,i)perylene, 2-methylnaphthalene, phenanthrene, and pyrene) characterized at the property under the SIA standard. Note: that the BER indicated that the elevated concentrations of the SVOCs detected at MW-6 raised the reported detection limits of some compounds above the NR MSCs; therefore, additional SVOCs may be present at MW-6

[2] "existing area of contaminated groundwater" is an area (with horizontal and vertical dimensions) that has been verifiably demonstrated to contain all relevant groundwater contamination for this determination, and is defined by designated (monitoring) locations proximate to the outer perimeter of "contamination" that can and will be sampled/tested in the future to physically verify that all "contaminated" groundwater remains within this area, and that the further migration of "contaminated" groundwater is not occurring. Reasonable allowances in the proximity of the monitoring locations are permissible to incorporate formal remedy decisions (i.e., including public participation) allowing a limited area for natural attenuation.

above the NR MSCs, although the analytical data reported these compounds as not detected. PADEP comments to the BER (dated November 16, 2007) indicated that characterization for those specific compounds would be considered incomplete, and relief of liability would not be extended for those compounds. AES responded on December 5, 2007 that because the laboratory detection limits were met for all SVOCs analyzed in MW-8 (located approximately 30 feet east of MW-6, in the interpreted direction of groundwater flow), the MW-8 data is representative of AOC 1 and relief of liability should be granted for all SVOCs detected in AOC 1. Also note that a relief of liability was not requested for metals identified at the site because, according to AES, the presence of metals was likely related to the deposition of fill materials (slag and foundry sands) used to abandon the former canal, rather than to former industrial operations conducted on-site.

Surface Water/Sediment: The nearest surface water body to the facility is Paxton Creek, located directly east of the main manufacturing building. The interpreted direction of shallow groundwater flow (unconfined) is to the east/northeast toward Paxton Creek. SPL has been identified in MW-6, approximately 85 feet west of the creek bed. However, no SPL has been observed in MW-8 located 29 feet east of MW-6 and approximately 55 feet west of the creek bed. Several VOCs and SVOCs have been detected above NR MSCs in monitoring wells located along the creek (including MW-3 located on the southeastern corner of the property, and MW-5, MW-6, and MW-8 that monitor the area containing the SPL).

4. Does "contaminated" groundwater **discharge** into **surface water** bodies?

_____ If yes - continue after identifying potentially affected surface water bodies.

_X_ If no - skip to #7 (and enter a "YE" status code in #8, if #7 = yes) after providing an explanation and/or referencing documentation supporting that groundwater "contamination" does not enter surface water bodies.

_____ If unknown - skip to #8 and enter "IN" status code.

Rationale and Reference(s):

AES conducted fate and transport modeling using SWLOAD5B for compounds requiring further evaluation based on the criteria outlined in the PADEP Technical Guidance Manual (Land Recycling Program Technical Guidance Manual, Document Number 253-0300-100, dated June 8, 2002), from which it was concluded that no further modeling (PENTOX) was required, and the groundwater discharge to surface water pathway was incomplete. Therefore, assuming that groundwater flow discharging to Paxton Creek from all areas of concern was evaluated via the fate and transport model, it is concluded that no controls are relevant for the surface water/sediment exposure pathway. Note: There are no monitoring wells located in the vicinity of the former hazardous waste storage area located on the north end of the property; therefore, it is unknown whether groundwater is impacted in this area, and if so, if impacted groundwater is migrating beneath the adjacent PennDOT property and to Paxton Creek above regulatory standards.

5. Is the **discharge** of "contaminated" groundwater into surface water likely to be **"insignificant"** (i.e., the maximum concentration[3] of each contaminant discharging into surface water is less than 10 times their appropriate groundwater "level," and there are no other conditions (e.g., the nature, and number, of discharging contaminants, or environmental setting), which significantly increase the potential for unacceptable impacts to surface water, sediments, or eco-systems at these concentrations)?

____ If yes - skip to #7 (and enter "YE" status code in #8 if #7 = yes), after documenting: 1) the maximum known or reasonably suspected concentration[3] of key contaminants discharged above their groundwater "level," the value of the appropriate "level(s)," and if there is evidence that the concentrations are increasing; and 2) provide a statement of professional judgement/explanation (or reference documentation) supporting that the discharge of groundwater contaminants into the surface water is not anticipated to have unacceptable impacts to the receiving surface water, sediments, or eco-system.

____ If no - (the discharge of "contaminated" groundwater into surface water is potentially significant) - continue after documenting: 1) the maximum known or reasonably suspected concentration[3] of each contaminant discharged above its groundwater "level," the value of the appropriate "level(s)," and if there is evidence that the concentrations are increasing; and 2) for any contaminants discharging into surface water in concentrations[3] greater than 100 times their appropriate groundwater "levels," the estimated total amount (mass in kg/yr) of each of these contaminants that are being discharged (loaded) into the surface water body (at the time of the determination), and identify if there is evidence that the amount of discharging contaminants is increasing.

____ If unknown - enter "IN" status code in #8.

Rationale and Reference(s):

[3] As measured in groundwater prior to entry to the groundwater-surface water/sediment interaction (e.g., hyporheic) zone.

6. Can the **discharge** of "contaminated" groundwater into surface water be shown to be "**currently acceptable**" (i.e., not cause impacts to surface water, sediments or eco-systems that should not be allowed to continue until a final remedy decision can be made and implemented[4])?

____ If yes - continue after either: 1) identifying the Final Remedy decision incorporating these conditions, or other site-specific criteria (developed for the protection of the site's surface water, sediments, and eco-systems), and referencing supporting documentation demonstrating that these criteria are not exceeded by the discharging groundwater; OR
2) providing or referencing an interim-assessment,5 appropriate to the potential for impact, that shows the discharge of groundwater contaminants into the surface water is (in the opinion of a trained specialists, including ecologist) adequately protective of receiving surface water, sediments, and eco-systems, until such time when a full assessment and final remedy decision can be made. Factors which should be considered in the interim-assessment (where appropriate to help identify the impact associated with discharging groundwater) include: surface water body size, flow, use/classification/habitats and contaminant loading limits, other sources of surface water/sediment contamination, surface water and sediment sample results and comparisons to available and appropriate surface water and sediment "levels," as well as any other factors, such as effects on ecological receptors (e.g., via bio-assays/benthic surveys or site-specific ecological Risk Assessments), that the overseeing regulatory agency would deem appropriate for making the EI determination.

____ If no - (the discharge of "contaminated" groundwater can not be shown to be "**currently acceptable**") - skip to #8 and enter "NO" status code, after documenting the currently unacceptable impacts to the surface water body, sediments, and/or eco-systems.

____ If unknown - skip to 8 and enter "IN" status code.

Rationale and Reference(s):

[4] Note, because areas of inflowing groundwater can be critical habitats (e.g., nurseries or thermal refugia) for many species, appropriate specialist (e.g., ecologist) should be included in management decisions that could eliminate these areas by significantly altering or reversing groundwater flow pathways near surface water bodies.

[5] The understanding of the impacts of contaminated groundwater discharges into surface water bodies is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration to be reasonably certain that discharges are not causing currently unacceptable impacts to the surface waters, sediments or eco-systems.

7. Will groundwater **monitoring** / measurement data (and surface water/sediment/ecological data, as necessary) be collected in the future to verify that contaminated groundwater has remained within the horizontal (or vertical, as necessary) dimensions of the "existing area of contaminated groundwater?"

X If yes - continue after providing or citing documentation for planned activities or future sampling/measurement events. Specifically identify the well/measurement locations which will be tested in the future to verify the expectation (identified in #3) that groundwater contamination will not be migrating horizontally (or vertically, as necessary) beyond the "existing area of groundwater contamination."

____ If no - enter "NO" status code in #8.

____ If unknown - enter "IN" status code in #8.

Rationale and Reference(s):

AES evaluated the groundwater discharge to surface water (Paxton Creek) pathway using fate and transport modeling software (SWLOAD5B). The results of the fate and transport modeling indicated that no additional modeling was necessary (PENTOX), and AES concluded that the groundwater discharge to surface water pathway was incomplete. Note: the fate and transport modeling may represent the future monitoring to show contaminated groundwater will remain within horizontal dimensions of the existing area of contaminated groundwater.

AES further concluded that the presence of SPL did not represent an immediate, direct, or imminent threat to public health or the environment given that there is a mandatory connection ordinance for potable water; the SPL was located at depth; and it was not mobile.

8. Check the appropriate RCRIS status codes for the Migration of Contaminated Groundwater Under Control EI (event code CA750), and obtain Supervisor (or appropriate Manager) signature and date on the EI determination below (attach appropriate supporting documentation as well as a map of the facility).

__X__ YE Yes, "Migration of Contaminated Groundwater Under Control" has been verified. Based on a review of the information contained in this EI determination, it has been determined that the "Migration of Contaminated Groundwater" is "Under Control" at the **Turbine Airfoil Designs, Inc.** facility, EPA ID # **PAD003010113**, located at **1400 North Cameron Street Harrisburg, Pennsylvania 17110**

Specifically, this determination indicates that the migration of "contaminated" groundwater is under control, and that monitoring will be conducted to confirm that contaminated groundwater remains within the "existing area of contaminated groundwater". This determination will be re-evaluated when the Agency becomes aware of significant changes at the facility.

____ NO - Unacceptable migration of contaminated groundwater is observed or expected.

____ IN - More information is needed to make a determination.

Completed by (signature) Kathleen Howarth Date 6-14-11

(print) Kathleen Horvath

(title) Sp Proj Chief

Supervisor (signature) John F Krueger Date 6/14/11

(print) John F Krueger

(title) Environmental Program Manager

(EPA Region or State) PA DEP

Locations where References may be found:

USEPA Region III
Waste and Chemical Mgmt. Division
1650 Arch Street
Philadelphia, PA 19103

PADEP
South Central Regional Office
909 Elmerton Avenue
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EPA ID# PAD003010113
City/State Harrisburg, PA 17110

MIGRATION OF CONTAMINATED GROUNDWATER UNDER CONTROL (CA 750)